

# First day (7<sup>th</sup>)

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"Paul Duval's day, what material science learns from ice study"

**8:30**      **Welcoming**

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## FROM DISLOCATION TO POLYCRYSTAL DUCTILE BEHAVIOR

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9:00 - 10:30	Dislocation dynamics - Intermittency, scale invariance and modelling
9:00 - 9:30	Spatio-temporal scaling properties of dislocation dynamics models, <b>Carmen Miguel</b> , Univ. of Barcelona, Spain
9:30 - 9:50	Concerning the Mobile Dislocation Density, <b>Armand Beaudoin</b> , Univ. of Illinois, USA.
9:50 - 10:10	3D Dislocation Dynamics Simulations of HCP materials: case of ice loaded in torsion and compressed micro-pillars of Magnesium, <b>Marc Fivel</b> , SIMAP, France
10:10 - 10:30	Characterizing spatial correlations in dislocation fields in ice single crystals, <b>Claude Fressengeas</b> , Univ. Metz, France

*Coffee break*

11:00 - 12:30	Grain growth and recrystallization
11:00 - 11:30	Nucleation of recrystallisation in metals : a physically based approach to critical conditions, <b>Yves Bréchet</b> , SIMAP, France
11:30 - 11:50	Modelling the role of stress gradients in dynamic discontinuous recrystallization, <b>François Louchet</b> , LGGE, France
11:50 - 12:10	Dynamic recrystallization of quartz – a natural analog for crystal plastic deformation of ice, <b>Michael Stipp</b> , IFM-GEOMAR, Germany
12:10 - 12:30	The effect of microstructure on static grain growth, <b>Paul Bons</b> , Tübingen Univ., Germany

*Lunch break*

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**BRITTLE BEHAVIOR**


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14:00 - 15:30	Brittle behaviour in ice and snow
14:00 - 14:30	Faulting in ice under high confinement, <b>Erland Schulson</b> , Dartmouth College, USA
14:30 - 14:50	A laboratory sea ice model to explore the interaction between fracture and healing processes, <b>Vincent Pellissier</b> , LGGE, France
14:50 - 15:10	A statistical approach to damage evolution applied to polycrystalline ice, <b>Arne Keller</b> , ETH Zürich, Switzerland
15:10 - 15:30	Crack propagation in model brittle heterogeneous material, <b>Jonathan Barés</b> , CEA, France
15:30 - 15:50	Weak snow layer failure, <b>Ingrid Reiweger</b> , SLF Davos, Switzerland

*Coffee break*

16:10 - 18:00	The sea ice and large-scale brittle behavior
16:10 - 16:40	Sea ice as a brittle material: from observational evidence to numerical modelling, <b>Jérôme Weiss</b> , LGGE, France
16:40 - 17:00	Impact of a new anisotropic rheology in the sea ice component of a global circulation model, <b>M. Tsamados</b> , Univ. College London, UK
17:00 - 17:20	Statistical model of dynamical sea ice deformation and breaking, <b>Agnieszka Herman</b> , Univ. of Gdansk, Poland
17:20 - 17:40	Brittle failure near the transition from grounded to floating ice, <b>Roiy Sayag</b> , Univ. of Cambridge, UK
17:40 - 18:00	Land-fast ice modelling in the Kara Sea, <b>Einar Orn Olason</b> , Max Planck Institute for Meteorology, Germany

**18:30**      **Ice breaker and pre-poster session.**

## Second day (8<sup>th</sup>)

Ice rheology; implications in natural extreme environments and in industry.

### NATURAL ICE

8:30 - 10:20	Ice rheology
8:30 - 9:00	Physical deformation mechanisms of ice at low stresses, <b>Paul Duval</b> , LGGE, France
9:00 - 9:20	Intragranular strain field in columnar ice during transient creep, <b>Fanny Grennerat</b> , LGGE, France
9:20 - 9:40	Combined simple shear and confined compression of polycrystalline ice: tertiary creep observations from laboratory deformation experiments, <b>Adam Treverrow</b> , Artic Climate and Ecosystems Cooperative Res. Center, Australia
9:40 - 10:00	Ice fabric development in compression and simple shear, <b>Christopher J.L. Wilson</b> , Monach Univ., Australia
10:00 - 10:20	Ice fabric heterogeneities in the deep part of NEEM ice core: implications for flow interpretation and stratigraphy, <b>Denis Samyn</b> , Nagaoka Univ., Japan

### Coffee break

11:00 - 12:30	Ice, an engineering point of view
11:00 - 11:30	Ice, materials and engineering, <b>Jane Blackford</b> , Univ. Edinburgh, UK
11:30 - 11:50	Downscaling of sea ice dynamics from mesoscale to local scale, <b>Matti Leppäranta</b> , Univ. of Helsinki, Finland
11:50 - 12:10	Ice cream research: taming an ice-based microstructure for sensory pleasures, <b>Javier Gil Sevillano</b> , Univ. of Navarra, Spain
12:10 - 12:30	Ice wall growth and the probability of falling ice blocks along the main transportation corridors of northern Gaspésie, Quebec, Canada <b>Francis Gauthier</b> , Univ. Laval, Canada

### Lunch break

14:00 - 15:50	<b>Extra-terrestrial ice</b>
14:00 - 14:30	Dynamics and evolution of icy satellites, <b>Gabriel Tobie</b> , LPG, France
14:30 - 14:50	Water ice deformation in glaciers and permafrost of the planet Mars, <b>Nicolas Mangfold</b> , LPG, France
14:50 - 15:10	The role of grain size in the rheology of planetary water ice, <b>Hans de Bresser</b> , Utrecht Univ., the Netherlands
15:10 - 15:30	Insight into the phase transformations between Ice Ih and Ice II from EBSD data, <b>David J. Prior</b> , Univ. of Otago, New Zealand
15:30 - 15:50	Combined rheological and neutron diffraction studies of planetary ice-rock analogues, <b>C.A. Middleton</b> , Univ. College London, UK

16:00 - 18:00 Poster session + beer party

**18:30 - 19:00 Evening seminar**

Avalanche modeling (F. Louchet)

## Third day (9<sup>th</sup>)

Recent techniques for ice and snow behaviour/microstructure characterization and modelling

### FIELD AND EXPERIMENT CHARACTERIZATION TECHNIQUES FOR ICE AND SNOW

8:30 - 10:20	Natural ice and snow microstructure
8:30 - 9:00	A Tour through Hexagonal Ice, <b>Kolumban Hutter</b> , ETH Zürich, Switzerland
9:00 - 9:20	Inferring ice crystal fabric from full waveform borehole sonic logging, <b>Alessio Gusmeroli</b> , Univ. Fairbank, Alaska
9:20 - 9:40	Ice microstructure in Antarctic deep drilling samples (EDML): Cryogenic EBSD, X-ray Laue diffraction and optical microscopy, <b>Ilka Weikusat</b> , AWI, Germany
9:40 - 10:00	Microstructure analysis of fresh snow densification, <b>Stefan Schleef</b> , SLF Davos, Switzerland
10:00 - 10:20	Features of the free and open source toolbox MTEX for texture analysis - application to ice cores from the Talos Dome, <b>David Mainprice</b> , Geoscience Montpellier, France

*Coffee break*

10:40 - 12:40	Microstructure characterization and interpretation
10:40 - 11:10	Strain heterogeneities and recrystallization in polycrystalline materials: Characterization and Interpretation, <b>Sandra Piazzolo</b> , Macquarie Univ., Australia
11:10 - 11:30	Advanced microstructural characterization of firn and ice, <b>Ian Baker</b> , Dartmouth College, USA
11:30 - 11:50	G60 Fabric Analyser: design overview and performance tests, <b>David Russell-Head</b> , Russell-Head Instruments, Melbourne, Australia
11:50 - 12:10	Synchrotron-based X-ray Tomographic Microscopy of Sea Ice, <b>Sönke Maus</b> , Univ. Bergen, Norway
12:10 - 12:30	Experimental testing of snow at the grain scale, <b>Jacques Meyssonier</b> , LGGE, France

*Lunch break*

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**MULTI-SCALE APPROACHES – MODELLING AND OBSERVATIONS**


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<b>14:20 - 16:10</b>	<b>Multi-scale modeling, ice and snow</b>
14:20 - 14:50	Elastoviscoplastic micromechanical modeling of the transient creep of ice, <b>Olivier Castelnau</b> , PIMM, France
14:50 - 15:10	Deformation of ice on the grain scale using a finite element fast Fourier transformation approach, <b>Jens Roessiger</b> , Tübingen Univ., Germany
15:10 - 15:30	Microstructures and rheology of the Earth's upper mantle inferred from a multiscale approach, <b>F. Detrez</b> , ENSAM, France
15:30 - 15:50	Modeling the evolution of microstructure and crystal fabric and its link to climate and ice sheet history, <b>Joseph Kennedy</b> , Univ. Fairbank, Alaska
15:50 - 16:10	3D image-based numerical simulations and experimental measurements of the effective thermal conductivity of snow, <b>Neige Calonne</b> , CEN, France

*Coffee break*

<b>16:40 - 17:40</b>	<b>Large scale ice flow dynamic</b>
16:40 - 17:00	Modelling the effect of anisotropy on large scale ice flows, <b>Olivier Gagliardini</b> , LGGE, France
17:00 - 17:20	Understanding ice rheology from the flow at ice divides, <b>Richard Hindmarsh</b> , BAS, UK
17:20 - 17:40	Numerical modelling of dense snow rheology by means of the FEM with Lagrangian integration points, <b>Dominique Daudon</b> , Lab 3SR, France

**18:30**      **End of the conference**